

**Notice of Allowability**

Application No.

10/023,930

Examiner

Laura S. Weiner

Applicant(s)

YAMAMOTO ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4-4-05.
2. ☒ The allowed claim(s) is/are 25,48,51-52 and 54-56.
3. ☒ The drawings filed on 21 December 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 04132005.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jason Okun on April 13, 2005.

The application has been amended as follows:

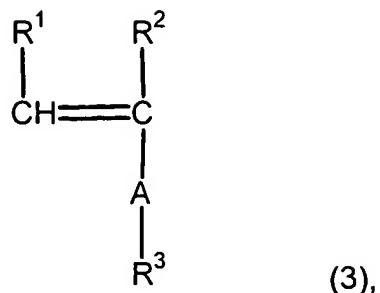
Please replace these claims with the claims in the application.

1-24. (Cancelled)

25. (Currently Amended) A process for producing an ion conductor structural body comprising at least a polymer matrix, a solvent capable of functioning as a plasticizer and an electrolyte, said process comprising the steps of:

(a) mixing (i) a monomer represented by the following general formula (3), (ii) a solvent, [[and]] (iii) an electrolyte and (iv) a polymerization initiator to obtain a mixture;

(b) subjecting said mixture to a polymerization treatment by way of a polymerization reaction to form a polymer matrix as said ion conductor structural body



wherein  $\text{R}^1$  and  $\text{R}^2$  is respectively H or an alkyl group of 2 or less carbon atoms, A is a group containing at least a polyether group, and  $\text{R}^3$  is a group having at least an alkyl group of 6 or more carbon atoms; and

(c) a step of forming a crosslinking structure in said polymer matrix by a crosslinking reaction,

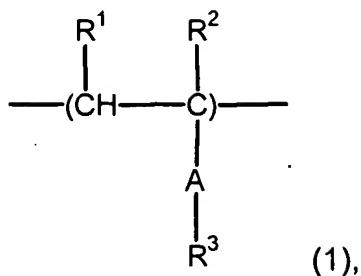
wherein said crosslinking structure comprises a covalent bond.

26-47. (Cancelled)

48. (Currently Amended) A rechargeable battery comprising an anode, a cathode and an ion conductor structural body provided between said anode and said cathode, said anode having a face which is opposed to a face of said cathode, wherein said ion conductor structural body comprises an ion conductor structural body (i) which principally comprises a polymer matrix, a solvent capable of functioning as a plasticizer and an electrolyte, said polymer matrix comprising a polymer chain having at least a segment represented by the following general formula (1), a main chain portion of said polymer chain and a side chain portion of said segment having an orientation property,

and said polymer matrix having a crosslinked structure, and said ion conductor structural body (i) is arranged such that an ion conductivity in a direction of connecting said face of said anode and said face of said cathode is increased

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wherein R<sup>1</sup> and R<sup>2</sup> are respectively H or an alkyl group of 2 or less carbon atoms, A is a group having at least a polyether group, and R<sup>3</sup> is a group having at least a alkyl group of more than 6 carbon atoms,

wherein said anode or/and said cathode contain ~~[[an]]~~ said ion conductor structural body.

49-50. (Cancelled)

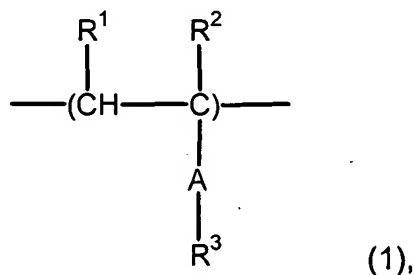
51. (Currently Amended) A process for producing a rechargeable battery comprising an anode, a cathode and an ion conductor structural body provided between said anode and said cathode, said anode having a face which is opposed to a face of said cathode, such that an ion conductivity in a direction of connecting said face of said anode and said face of said cathode is increased, the process comprising:  
~~characterized by including a step of~~

forming said anode and/or said cathode to contain said ion conductor structural body having a high ion conductivity and an excellent mechanical strength, principally comprising (a) a polymer matrix, (b) a solvent capable of functioning as a plasticizer and (c) an electrolyte; and

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arranging said ion conductor structural body between said anode and said cathode.

wherein said polymer matrix (a) comprises a polymer chain having at least a segment represented by the following general formula (1), a main chain portion of said polymer chain and a side chain portion of said segment have an orientation property, and said polymer matrix has a crosslinked structure



wherein  $\text{R}^1$  and  $\text{R}^2$  are respectively H or an alkyl group of 2 or less carbon atoms, A is a group having at least a polyether group, and  $\text{R}^3$  is a group having at least a alkyl group of more than 6 carbon atoms, ~~such that an ion conductivity in a direction of connecting said face of said anode and said face of said cathode is increased.~~

52. (Original) The process according to claim 51, further including a step of forming said ion conductor structural body on said anode or/and said cathode and arranging the anode and the cathode so as to oppose to each other.

53. (Cancelled)

54. (Currently Amended) The process according to claim ~~[[53]]~~ 51, wherein a solution containing at least one kind of a material selected from the group consisting of a polymer, a monomer and an oligomer which are capable of being starting materials for forming a polymer matrix of said ion conductor structural body is impregnated in an active material layer of said anode or/and an active material layer of said cathode and said polymer matrix is formed in said active material layer of said anode or/and said active material layer of said cathode.

55. (Original) The process according to claim 54, wherein the formation of said ion conductor structural body is performed by way of polymerization reaction or/and crosslinking reaction.

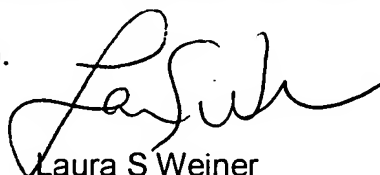
56. (Currently Amended) The process according to claim ~~[[53]]~~ 51, wherein said anode or/and said cathode are formed by admixing said ion conductor structural body in an active material and disposing said active material on a collector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura S. Weiner', is positioned above the printed name.

Laura S Weiner  
Primary Examiner  
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April 13, 2005